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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/034,336	03/04/98	AGA	H AGA-6

BROWDY AND NEIMARK  
419 SEVENTH STREET N W  
WASHINGTON DC 20004

HM12/0331

EXAMINER

MORAN, M

ART UNIT	PAPER NUMBER
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1623

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DATE MAILED: 03/31/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/034,336

Applicant(s)  
Aga et al.

Examiner  
Marjorie Moran

Group Art Unit  
1623

☒ Responsive to communication(s) filed on Jun 26, 1998

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-26 is/are pending in the application.

Of the above, claim(s) 1-4 and 11-26 is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 5-10 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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## **DETAILED ACTION**

### ***Election/Restriction***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-4 and 11-26, drawn to an agent and composition comprising trehalose, classified in class 424, subclass 195.1.
- II. Claims 5-10, drawn to a method of inhibiting the reduction of antioxidant activity, classified in class 435, subclass 4.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the trehalose agent and composition of Group I can be used as a sweetener.

These inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and have acquired a separate status in the art because of their recognized divergent subject matter, therefore restriction for examination purposes as indicated is proper. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

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During a telephone conversation with Mr. Sheridan Neimark on 2/16/99 a provisional election was made with traverse to prosecute the invention of Group II, claims 5-10.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-4 and 11-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

An action on the merits of elected claims 5-10 follows.

### ***Specification***

The abstract of the disclosure is objected to because it is one runon sentence. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

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Claim 5 is objected to because of the following informalities. Claim 5 recites the term "active-oxygen-eliminating" in lines 1-2 and 3-4. This term is not commonly used in the art and is not defined in the specification; however, one of skill in the art would interpret the term to be equivalent to --antioxidant--. For the sake of clarity, therefore, the examiner suggests replacing "active-oxygen-eliminating" with --antioxidant-- wherever it appears in the claims.

***Claim Rejections - 35 USC § 112***

Examiner's note: The term "contains" recited in claim 10, line 1 is interpreted by the examiner to be open claim language, equivalent to --comprises--.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "reduction" is recited in line 1 of claim 5. It is unclear if the "reduction" referred to is movement of electrons, as in an oxidation-reduction type of reaction, or simply refers to a decrease in activity, e.g. of an enzyme, therefore the claim is indefinite.

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Regarding claim 5, the term "with" is recited in line 3. It is unclear if "with" is intended to be open claim language, equivalent to --comprising--, or closed, equivalent to --consisting of--, therefore the claim is indefinite.

Claim 5 recites the term "in an aqueous system" in line 4. It is unclear if the inhibition method of line 1, the incorporation step of line 2, the plant substance of line 3, or activity of lines 3-4, is in the aqueous system, therefore this claim is indefinite.

Claim 6 recites the term "a plant antioxidant" in lines 2-3. It is unclear if this antioxidant is the same as the "active-oxygen eliminating activity" in a plant substance, interpreted by the examiner to be a plant substance comprising antioxidant activity, recited in claim 5, lines 3-4, or if the plant antioxidant of claim 6 is intended to be different from that of claim 5, therefore this claim is indefinite.

Claim 7 recites the term "said plant edible substance" in lines 1-2. There is insufficient antecedent basis for this term in the claims, therefore the claim is indefinite. This rejection may be overcome by amending the claim to depend from claim 6, which provides antecedent for a plant edible substance, or by deleting the term "edible" from line 1.

Claim 9 recites the term "said trehalose" in line 2. There is insufficient antecedent basis for this term in the claims, therefore the claim is indefinite. This rejection may be overcome by deleting the term "said" in line 2.

Claim 9 recites the term "effective ingredient" in lines 2-3. It is unclear what the ingredient is effective for, therefore use of this term renders the claim indefinite.

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Claim 10 depends from claim 5 and recites one or two steps. It is unclear if these steps are intended to be added to the incorporation step of claim 5, or are intended to replace the step of claim 5, therefore this claim is indefinite. If applicant intends the former, then this rejection may be overcome by inserting the word --further-- after "which" in line 1.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over MARUTA *et al.* (A).

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Applicant claims a method to inhibit the reduction of antioxidant activity, which method comprises incorporation of a "reduction inhibitory" agent comprising trehalose into a plant substance comprising antioxidant activity. Examiner's note: the term "inhibit the reduction" is unclear (see above), therefore the examiner interprets applicant's claim to be (a) a method to protect/preserve antioxidant activity.

MARUTA teaches that trehalose may be used as a stabilizer for biologically active substances such as thiamine, riboflavin, L-ascorbic acid, and tocopherol (col. 13, line 656-col. 14, line 17, all known to exhibit antioxidant activity. MARUTA also teaches incorporation of trehalose into edible plant substances (col. 13, lines 7-40). MARUTA further teaches that trehalose may be incorporated at levels as high as 75%, and that products may be dried after trehalose incorporation (col. 34, lines 30-39). MARUTA does not specifically teach a method of inhibiting the reduction of antioxidant activity, wherein reduction is interpreted by the examiner to mean "decrease."

A method of stabilizing the activity of an antioxidant is a method of inhibiting the decrease of that activity, therefore MARUTA suggests a method of inhibiting the reduction (decrease) of antioxidant activity. It would have been obvious to one of ordinary skill in the art to have incorporated trehalose into edible plant substances, as taught by KUBOTA, in order to stabilize antioxidant activity in those substances, as suggested by KUBOTA, where the motivation would have been to enhance the quality and "healthfulness" of the finished product. For this reason, claims 5-10 are obvious.



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Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over HERSH (B) in view of KUBOTA (AC), further in view of CARPENTER (E).

Applicant claims a method to inhibit the reduction of antioxidant activity, which method comprises incorporation of a "reduction inhibitory" agent comprising trehalose into a plant substance comprising antioxidant activity. Examiner's note: the term "inhibit the reduction" is unclear (see above), therefore the examiner interprets applicant's claim here to be (b) a method to protect an antioxidant from oxidation-reduction (redox) type reactions which would inhibit or decrease antioxidant activity.

HERSH teaches a method of preventing redox cycling reactions in order to protect antioxidant (free radical scavenging) activity of an antioxidant (col. 5, lines 56-60) , and further teaches glutathione peroxidase and superoxide dismutase (SOD) as antioxidants (col. 5, lines 31-35 and lines 46-52). HERSH does not teach trehalose nor a plant substance comprising antioxidant activity.

KUBOTA teaches incorporation of trehalose into a composition comprising powdered orange juice (an extracted dried plant part comprising vitamin C, an antioxidant) and L-ascorbic acid (a plant antioxidant) on p. 84 (Example B-6). KUBOTA also teaches incorporation of trehalose at about 12% by weight into a bean paste (p. 86, Example B-9). KUBOTA further teaches drying of edible plant substances mixed with trehalose (p. 88, Example B-12). KUBOTA does not teach trehalose as a reduction inhibitory agent.

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CARPENTER teaches that trehalose can protect enzyme activity from dehydration (p. 464, right column).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the teachings of the method of HERSH to protect antioxidant activity by preventing redox cycling in order to protect antioxidant activity in edible plant substances with the trehalose in the dried or liquid products of KUBOTA, where the motivation would have been to use a commonly known preservative, trehalose, to further protect a desired activity (i.e. enzyme or antioxidant activity) in an edible product. One of ordinary skill in the art would reasonably have anticipated success in using trehalose in the method of HERSH to protect antioxidant activity because CARPENTER teaches that trehalose can protect against dehydration and dehydration is a form of reduction, therefore CARPENTER teaches that trehalose can both protect enzyme (e.g. antioxidant) activity and protect against redox cycling. For these reasons, claims 5-10 are obvious.

### ***Conclusion***

Claims 5-10 are rejected; claims 1-4 and 11-26 are withdrawn as being drawn to a nonelected invention. The abstract is objected to.

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The prior art made of record and not relied upon which is considered pertinent to applicant's disclosure is AGA *et al.* (C) and PANEK (D).

Papers relating to this application may be submitted to Technology Center 1600 by facsimile transmission. The number of the fax machine for official papers in Technology Center 1600 is (703) 308-4556. Any document submitted by facsimile transmission will be considered an official communication unless the cover sheet clearly indicates that it is an informal communication.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marjorie Moran whose telephone number is (703) 305-2363. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 4:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode, can be reached at (703) 308-4311. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1235.

Marjorie A. Moran  
Patent Examiner  
Art Unit 1623



mm  
3/29/99



**MARIAN C. KNODE**  
**SUPERVISORY PATENT EXAMINER**  
**GROUP 1623**

